CLAIMS

What is claimed is:

1. A convergence process for CRT projection systems comprising the steps of

a. projecting a first spot of light from a first CRT on to a screen,

b. determining the position of the light within a region of measurement (ROM), wherein the screen comprises a plurality of ROMs,

c. determining the center of the ROM in which the light is positioned, and

d. directing the light to the center of the ROM.

2. The process of claim 1 further comprising the step of repeating steps a through d for each of the plurality of ROMs.

3. The process of claim 2 further comprising the step of repeating steps a through d for second and third CRTs for each of the plurality of ROMs.

4. The process of claim 1 wherein the step of determining the position of the light within the ROM, step b, includes mapping the image of the ROM onto a detector element comprising first, second, third and fourth individual detectors.

5. The process of claim 4 wherein the step of determining the position of the light within the ROM, step b, includes

turning the spot of light ON and OFF,

when the spot is ON,

summing the outputs of the first and second detectors and

adding the sum to a first ON accumulator,

summing the outputs of the first and third detectors and adding the sum to a second ON accumulator,

summing the outputs of the second and fourth detectors and adding the sum to a third ON accumulator, and

summing the outputs of the third and fourth detectors and adding the sum to a fourth ON accumulator,

when the spot is OFF,

summing the outputs of the first and second detectors and adding the sum to a first OFF accumulator,

summing the outputs of the first and third detectors and adding the sum to a second OFF accumulator,

summing the outputs of the second and fourth detectors and adding the sum to a third OFF accumulator, and

summing the outputs of the third and fourth detectors and adding the sum to a fourth OFF accumulator,

comparing the values of the first, second, third and fourth ON accumulators with the values of the first, second, third and fourth OFF accumulators, and

repeating the foregoing steps until the difference in value between at least one of the sets of ON and OFF accumulators meets or exceeds a predetermined value.

6. The process of claim 5 wherein the step of determining the center of ROM, step c, includes

illuminating the first spot,

summing the output of a first vertical pair of detectors and storing the sum as S1,

summing the output of a second vertical pair of detectors and storing the sum as S2,

illuminating a spot in the same row as and closer to a vertical axis of the ROM than the first spot,

summing the output of the first vertical pair of detectors and storing the sum as S1(n),

summing the output of the second vertical pair of detectors and storing the sum as S2(n),

comparing S1 to S1(n) and S2 to S2(n) to determine if the output of the first vertical pair of detectors have dropped and the output of the second vertical pair of detectors has risen, and

repeating the foregoing steps for n spots until the output of the first vertical pair of detectors have dropped and the output of the second vertical pair of detectors has risen.

7. The process of claim 6 wherein the step of determining the center of ROM, step c, includes

illuminating the first spot,

summing the output of a first horizontal pair of detectors and storing the sum as S1,

summing the output of a second horizontal pair of detectors and storing the sum as S2,

illuminating a spot in the same column as and closer to a horizontal axis of the ROM than the first spot,

summing the output of the first horizontal pair of detectors and storing the sum as S1(n),

summing the output of the second horizontal pair of detectors and storing the sum as S2(n),

comparing S1 to S1(n) and S2 to S2(n) to determine if the output of the first horizontal pair of detectors have dropped and the output of the second horizontal pair of detectors has risen, and

repeating the foregoing steps for n spots until the output of the first horizontal pair of detectors have dropped and the output of the second horizontal pair of detectors has risen.

8. The process of claim 5 wherein the step of determining the center of ROM, step c, includes

illuminating the first spot,

summing the output of a vertical pair of detectors that does not see the first spot and storing the sum as S,

illuminating a spot in the same row as and closer to a vertical axis of the ROM than the first spot,

summing the output of the same vertical pair of detectors and storing the sum as S(n),

comparing S to S(n) the output of the vertical pair of detectors has risen, and

repeating the foregoing steps for n spots until the output of the vertical pair of detectors has risen.

9. The process of claim 5 wherein the step of determining the center of ROM, step c, includes

illuminating the first spot,

summing the output of a horizontal pair of detectors that does not see the first spot and storing the sum as S,

illuminating a spot in the same column as and closer to a horizontal axis of the ROM than the first spot,

summing the output of the same horizontal pair of detectors and storing the sum as S(n),

comparing S to S(n) the output of the horizontal pair of detectors has risen, and

repeating the foregoing steps for n spots until the output of the horizontal pair of detectors has risen.

10. The process of claim 2 wherein steps a through d are repeated for each ROM for a second plurality of ROMs wherein the second plurality of ROMs comprise ROMs that are smaller in size than the ROMs of the plurality of ROMs.

11. The process of claim 1 further comprising the step of centering the ROMs on the screen.

12. The process of claim 11 wherein the step of centering the ROMs on the screen includes locating a plurality of beacon dots positioned about the periphery of the screen.

13. The process of claim 12 wherein the plurality of beacon dots includes at least four (4) beacon dots.

14. The process of claim 12 wherein locating the beacon dots includes the steps of

illuminating all of the spots from first, second and third CRTs at a first predetermined location,

determining the output of a detector and storing as L1,

illuminating all of the spots from first, second and third CRTs at a second predetermined location,

determining the output of a detector and storing as L2,

determining if the value of L1 is less than or greater than L2 by a predetermined amount,

repeating the preceding steps for each of the plurality of beacon dots, and

centering the plurality of ROMs on the screen.

15. A projection system comprising,

a screen,

a projection unit optically coupled to the screen, and

a detection system optically coupled to the screen, the detection system comprising an optical element and a detector element, the optical element being adapted to map a plurality of regions of measurement (ROMs) onto the detector element.

16. The projection system of claim 15 wherein the optical element comprises an array of lenses.

17. The projection system of claim 16 wherein the lenses are convex.

18. The projection system of claim 16 wherein the lenses are Fresnel lenses.

19. The projection system of claim 15 wherein the optical element comprises a hologram.

20. The projection system of claim 15 wherein the detector element comprises a plurality of photocells.

21. The projection system of claim 15 further comprising a plurality of beacon dots.

22. A projection system comprising,

a screen,

a projection unit optically coupled to the screen,

a plurality of beacon dots positioned about the periphery of the screen, and

a detection system optically coupled to the screen and the plurality of beacon dots.

23. The projection system of claim 22 wherein the detection system includes a photocell and a lens coupled to the photocell .

24. The projection system of claim 23 wherein the lens is a fish eye lens.

25. The projection system of claim 23 wherein the lens is an insect eye lens.

26 . The projection system of claim 22 wherein the detection system comprises an optical element and a detector element comprising an array of photodetectors, the optical element being adapted to map a plurality of regions of measurement (ROMs) onto the detector element.

27. The projection system of claim 26 wherein the optical element comprises an array of lenses.

28. The projection system of claim 27 wherein the lenses are convex and hexagonal.

29. The projection system of claim 27 wherein the lenses are Fresnel lenses.

30. The projection system of claim 26 wherein the optical element comprises a hologram.

31. A projection system comprising,

a screen,

a projection unit optically coupled to the screen,

a control panel comprising a plurality of wireless control button assemblies, and

a detection system optically coupled to the screen and the plurality of control button assemblies.

32. The projection system of claim 31 wherein the detection system comprises an optical element coupled to a detector element.

33. The projection system of claim 32 wherein the optical element includes a fish eye lens and the detector element includes a photocell.

34. The projection system of claim 32 wherein the optical element is adapted to map a plurality of regions of measurement (ROMs) onto the detector element.

35. The projection system of claim 32 wherein the detector element includes an array of photocells.

36. The projection system of claim 34 wherein the optical element comprises an array of lenses.

37. The projection system of claim 36 wherein the lenses are convex.

38. The projection system of claim 36 wherein the lenses are Fresnel lenses.

39. The projection system of claim 34 wherein the optical element comprises a hologram.

40. The projection system of claim 31 wherein the button assemblies comprise a button operably coupled to a reflector element.

41. The projection system of claim 40 wherein the reflector element is pivotally mounted.

42. The projection system of claim 41 further comprising a stop positioned to stop travel of the reflective element.

43. The projection system of claim 42 further comprising a spring coupled to the reflective member and to a fixed element to the reflective element to return the reflective element to a pre-operative position when the button is released.